

**INTERIM STRIKE FORCE HEADQUARTERS DIGITAL
LNO NODES: FORCE TAILORING ENABLERS**

**A MONOGRAPH
BY
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Armor**



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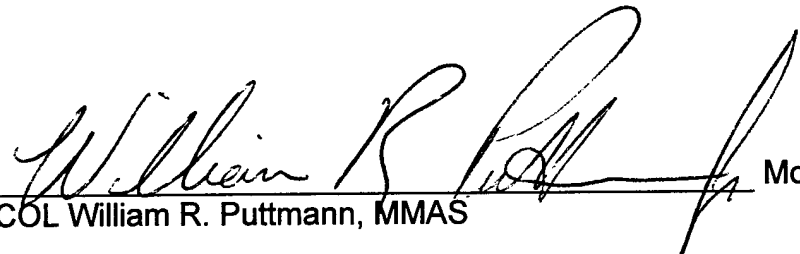
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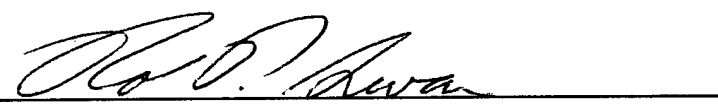
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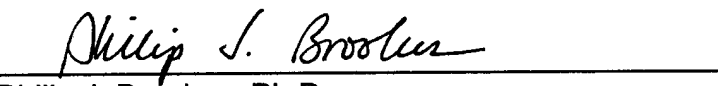
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ABSTRACT

INTERIM STRIKE FORCE HEADQUARTERS DIGITAL LNO NODES: FORCE TAILORING ENABLERS by MAJ Wayne A. Green, USA, 56 pages.

The Interim Strike Force Headquarters organizational concept has emerged as the experimental platform upon which the US Army will examine how to reorganize the Army in the near term to meet the conflicting demands of National Security Strategy, force projection and resource constraints. This new design seeks to create a force which is more rapidly deployable, more lethal, modular, more mobile, more sustainable, and more survivable. By enabling the Strike Force Headquarters to operate in a decentralized manner and avoid the pitfalls of information pathology the Digital LNO Nodes provide the organizational adaptability required to enable Strike Force organizational tailoring.

Force tailoring offers a powerful solution to alleviate this tension between requirements and constraints. Force tailoring is defined as "the capability to determine the right mix and sequencing of units with sufficient combat power to accomplish the mission and sustain the force, based on METT-T, analysis, and other criteria such as available lift, pre-positioned assets and host nation support."

This monograph addresses the challenges posed by force tailoring. In particular, this monograph seeks a remedy to the challenges posed by an increased span of control, operating in a more complex environment, the loss of organizational cohesion posed by task organizing on short notice, command and control issues associated with decentralized execution and the threat of information pathology.

A review of the theory of complex systems indicates that all complex adaptive systems require control mechanisms to ensure that the self-regulating and adaptive qualities of the system survive in a turbulent environment. This suggests that the Interim Strike Force requires integrative control mechanisms in order to remain adaptive and self-organizing. The Digital LNO nodes, serving as directed telescopes, serve this vital function.

The German General Staff model of using directed telescopes to enable decentralized execution is presented as empirical evidence of the efficacy of integrative control mechanisms to ensure system adaptiveness. This monograph suggests that the selection and training of directed telescopes for the German General Staff is an effective template for Interim Strike Force LNO Node development.

Finally, the monograph analyzes the ability of Digital LNO's to provide the system adaptiveness required to enable force tailoring as measured against Eliot A. Cohen and John Gooch's criteria for adaptive organizations in their book Military Misfortunes. The monograph concludes by recommending attributes of an LNO that are required for them to serve as successful directed telescopes for the Interim Strike Force Headquarters.

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Chapter 1

INTRODUCTION

The United States Army is amidst a period of dramatic organizational change which seeks to align US Army capabilities more closely with US National Security challenges. In fact there is a triumvirate of tension between the increased emphasis on force projection from the Continental United States, the National Security Strategy requirements of global engagement, and budgetary and force development considerations which constrain the size and capabilities of the military. TRADOC Pamphlet 525-68, "Concept for Modularity", articulates that:

Recent changes in the world and political environments have resulted in changes to our National Military Strategy. The United States Army has changed from a forward presence and rapid reinforcement force to a force projection force. The Army has taken on an ever increasing array of potential missions to include drug interdiction, peacekeeping, humanitarian missions, and disaster relief. However, the Army's primary mission will continue to be that of deterring war, and if deterrence fails to fight and win decisively. . . Force projection around the world is a difficult task. Commanders must often deal with force strength constraints, limits on available forces, dollar constraints, and limits on strategic lift required to transport the necessary capability into theater.¹

The Strike Force organizational concept emerged as the experimental platform upon which the US Army will examine how to reorganize the Army in the near term to meet these conflicting demands of National Security Strategy, force projection and resource constraints. This new design seeks to create a force which is more rapidly deployable, more lethal, modular, more mobile, more sustainable, and more survivable.² Lieutenant General Randall Rigby, Deputy Commander of US Army Training and Doctrine Command (TRADOC), indicates that "the Strike Force concept is not designed to create

separate stand-alone formations within the current force structure. Rather, it will focus on creating headquarters units, consisting of no more than 200 personnel, that can pull from both the service's light and heavy forces and tailor them to the mission at hand." ³

The Strike Force concept envisions a force that will fill the gap between the more deployable but less lethal light force and the lethal but less deployable heavy force.

Ultimately, the Strike Force will test organizational structure, leader development, and training and soldier support concepts that could enable the future force imperatives of deployability, lethality, modularity, mobility, sustainability, and survivability that are required to address the new environment.

In light of the requirement to develop an organizational force structure for the US Army which exhibits the adaptability required to fulfill a complex array of missions, this monograph explores the following issue: Can the Interim Strike Force Digital LNO Nodes provide the organizational adaptability required to enable Interim Strike Force tailorability? This monograph concludes that the Interim Strike Force Digital LNO Nodes, properly configured and trained, will serve as control mechanisms that enable the Strike Force to leverage the power of force tailoring. All complex open military systems must have a control mechanism to maintain the dynamism which is necessary for it to remain adaptive and self-organizing. Digital LNO Nodes serve this essential function for the Interim Strike Force Headquarters. As control mechanisms, the Digital LNO's can provide the adaptive qualities required of the Interim Strike Force to tailor forces to specific mission requirements.

Force tailoring seeks to streamline an organization by "tailoring" it to specific mission requirements. In the case of the Interim Strike Force beginning in 2001 this will

consist of rapidly "plugging" capabilities into a stand alone Interim Strike Force Headquarters and expanding or contracting the headquarters itself as required on short notice. Because "unnecessary" equipment and personnel are not deployed into theater, deployment lift requirements and the in-theater "footprint" can be substantially reduced. As a result, the deployed Strike Force is more mobile, more rapidly deployable, more sustainable and more survivable. However, force tailoring could create substantial command and control complexities as the Interim Strike Force Headquarters seeks to leverage greater lethality from a wider range of capabilities (joint, multinational, light, heavy, host nation. . .), task organizes on short notice, and operates in an extended battlespace. System control mechanisms will play a vital role in allowing the system to maintain its adaptive and self-organizing qualities in this complex environment.

Force tailoring is at the heart of the Interim Strike Force Headquarters concept. Chapter 2 of this monograph defines force tailoring and outlines the evolution of the Interim Strike Force Headquarters structure as it relates to force tailoring. A review of the National Security Strategy for a New Century reveals that the challenges facing the Army into the next century will require a force structured to adapt to and perform a wide range of military operations from a force projection versus a forward deployed posture. As mentioned, in order to meet these challenges, the future force structure must be rapidly deployable, lethal, modular, mobile, sustainable and survivable.⁴ This strategic analysis has prompted US Army decision makers to proceed with implementation of the Interim Strike Force Headquarters. Chapter 2 concludes with a detailed explanation of the Interim Strike Force Headquarters concept, organizational structure and planning horizons for the Interim Strike Force Headquarters initiative. Special attention is devoted

to describing the current organization of the Strike Force Headquarters Control Group Digital LNO Nodes.

Chapter 3 describes the nature of the complexities facing the Interim Strike Force Headquarters. Ultimately this chapter seeks to answer: How do the expanded missions and force tailoring concept affect the complexity of the command and control tasks facing the Interim Strike Force Headquarters? This chapter outlines the increased complexity posed by force tailoring. Theory will provide a framework to understand the complexity of the battlefield environment confronting the Interim Strike Force Commander. Dr James Schneider, in "Cybershock", indicates that an organization's ability to adapt rests with the ways in which it processes information. Further, in his book The Logic of Failure, Dietrich Doerner indicates that: "We combat uncertainty either by acting hastily on the basis of minimal information or by gathering excessive information, which inhibits action and may even increase our uncertainty." ⁵ These works lay the groundwork for a discussion of Martin van Creveld's concept of information pathology. Information pathology is the inability of organizations to obtain a clear, timely picture of their surroundings and their own functioning, owing to structural defects.⁶ Theory suggests, then, that an organization's structure can influence its ability, or inability, to process information adequately and thereby determine the organization's ability to adapt to a changing and uncertain environment. Given the nature of the strategic environment, the proposed missions, concepts and structure of the Interim Strike Force Headquarters, this monograph assesses the Interim Strike Force's susceptibility to information pathology.

Chapter 4 describes the role of control mechanisms for adaptive military systems. This chapter supports the assertion that all complex open military systems must have a control mechanism to maintain the dynamism which is necessary for it to remain adaptive and self-organizing. Waldrop's Complexity, Beniger's The Control Revolution, Senge's The Fifth Discipline, and Naveh's In Pursuit of Military Excellence all provide insights into the nature of complex systems and the control mechanisms, organizational constructs and concepts required for an organization to retain adaptive and self-organizing qualities that ensure its effectiveness and perhaps its survival in a complex environment.

Chapter 5 presents an historical example as empirical evidence of the efficacy of LNO's as control mechanisms that contribute to force adaptability. The monograph will examine the decentralized command and control structure of the German Army, assembled for the conduct of the Ludendorf offenses of 1918. This structure is starkly contrasted with the centralized British organizational structure that met disaster at the First Battle of the Somme in 1916. The role of the LNO as a directed telescope is examined. Martin van Creveld, in Command in War, presents the concept of the directed telescope as a method for the commander to reduce ambiguity and immunize the organization against information pathology. A directed telescope is a specially selected, highly qualified, and trusted officer who serves as a special agent of the commander to obtain timely, accurate and relevant information about the enemy, friendly forces or the terrain to support commander information requirements.⁷ Analysis will provide empirical evidence elucidating the advantages and disadvantages of the directed telescope approach for force tailoring.

Chapter 6 analyzes the role of the Digital LNO node in supporting organizational adaptability as described in Cohen and Gooch's Military Misfortunes, The Anatomy of Failure in War. This analysis shows how the Digital LNO nodes can serve as control mechanisms to ensure adaptability; measured against criteria for an adaptable organization.

Finally, Chapter 7 provides recommendations and conclusions regarding the feasibility of employing Digital LNO Nodes as control mechanisms. This chapter outlines how the Digital LNO nodes can provide the control mechanisms required for the Interim Strike Force Headquarters to remain an adaptive and self-regulating system. With these control mechanisms in place the Interim Strike Force Headquarters can compensate for the increased complexity wrought by tailorability and leverage the advantages of a tailorable force structure. The recommendations include training and organizational cultural changes required to successfully employ these Digital LNO Nodes. Also, this monograph suggests potential Digital LNO battle tasks, and required skills, knowledge and attributes (SKA's) of the LNO team members. This monograph concludes that the Interim Strike Force Digital LNO Nodes, properly configured and trained, will serve as control mechanisms that enable the Strike Force to leverage the power of force tailoring. Therefore, it is imperative that we first examine more closely the potential advantages and challenges associated with force tailoring.

Chapter 2

Force Tailoring: The Heart of Interim Strike Force Design

In a tale of war, the fierce glory that plays on red triumphant bayonets dazzles the observer. Nor does he care to look behind to where along the thousand miles of rail, road and river, the convoys are crawling to the front in uninterrupted succession. **Victory is the beautiful, bright colored flower. Transportation is the stem without which it would never have blossomed.**⁸

Winston Churchill, The River War, 1899

Winston Churchill offers an obvious yet salient warning. A nation determined to project power from its homeland is limited to its capability to transport and sustain combat power. His observation highlights one of the primary challenges facing the US Army and precipitating a change to its force structure. A force projection Army is limited by available strategic lift assets. Force projection realities, perhaps more than any other factor, precipitate the need for the US Army to re-evaluate its force structure. Clearly, the Army is an irrelevant force if it is incapable of rapidly deploying the necessary force, with the proper mix of functions, to the right place at the right time. This is all the more evident given the realization that "future adversaries will not wait until the majority of our forces and infrastructure are present before initiating offensive operations."⁹ In order to adequately fulfill its role as an early entry force capable of decisive operations as well as to conduct stability and support missions, the US Army must adapt itself, within the confines of existing force strengths and capabilities, into a force that is more rapidly deployable, more lethal, and more modular, mobile, sustainable, and survivable than the existing force structure.¹⁰ TRADOC Pamphlet 525-5, Force XXI Operations; A Concept for the Evolution of Full-Dimensional Operations

for the Strategic Army of the Early Twenty-First Century; introduces force tailoring as an engine for change. It states:

The future Army will be smaller, yet have new, expanded and diverse missions in an unpredictable, rapidly changing world environment. These factors mandate change in the way we organize. First, it is essential that we be able to **rapidly tailor organizations for operations**. Second, we must organize around information processing and dissemination. Third, leader-to-led ratio must change and be flexible for specific missions. Likewise, staffs may not be constant in size, but be **tailorable to the mission**. Fourth, we must organize around the division as the major tactical formation with the capability to **tailor it for specific mission purposes**. Fifth, combat support and combat service support must be **modular**, then capable of task-organizing for the mission. Future organizational design will capitalize on the full range of mission capabilities available in the Total Force structure. . . These Force XXI units led by innovative commanders more than likely will be **modular in design**, allowing the **rapid tailoring of units** to operate within any potential contingency situation in joint and multinational operations. Based on these factors, experimentation in organizational design. . will be essential to evaluate and refine the future concepts of the type described herein.¹¹

Written in August of 1994, this TRADOC document clearly articulates the glidepath for future experimentation with Army organizational design. The Strike Force concept represents the implementation of that vision as the century comes to a close. How does the Strike Force concept address the seeming contradiction between an increase in the scope and complexity of mission requirements and the constraints of existing force structure and deployability of forces? Force tailoring offers a powerful solution to alleviate the tension between requirements and constraints.

Force tailoring is defined as "the capability to determine the right mix and sequencing of units with sufficient combat power to accomplish the mission and sustain the force, based on METT-T, analysis, and other criteria such as available lift, pre-positioned assets and host nation support."¹² Force tailoring represents a conceptual shift from the past whereby Army units "were expected to participate as a part of a large land

force operating in cold war scenarios, mostly in Europe. These scenarios capitalized on large forward deployed forces in well established theaters."¹³ This conceptual shift to force tailoring for force projection is at the heart of the Strike Force concept recently introduced by General Reimer, the US Army Chief of Staff. General Reimer told an Association of the United States Army audience in Arlington, Virginia on January 7, 1999: "Strike Force is about a new concept of being able to deploy an adaptable force with multiple functions to meet the different threats that we face."¹⁴ While, the US Army has little control over limitations on numbers of forward deployed troops, limitations on global air and sea lift capacity, port and airfield capability in theaters worldwide and the like; it is faced with solving the issue of deploying a strategically relevant force anywhere in the world on short notice to perform a full spectrum of missions. Arguably the current US Army force structure is inadequate to fulfill this responsibility.

Many argue that the US Army structure is both too heavy and too light to generate a relevant force projection force given the complexity of the strategic environment. John Gordon IV and Peter A. Wilson, in "The Case for Army XXI 'Medium Weight' Aero-Motorized Divisions", argue that. . . "Structurally, today's Army is quite similar to the force at the end of the Vietnam period -- a mix of very light and very heavy units. They indicate that:

During the Cold War, the primary and potentially most challenging Army missions were the defense of Western Europe and Korea. In both locations the Army had relatively large forces in place. The deployment penalty associated with armored units weighed heavily on military planners and led to a great dependence upon pre-positioned equipment sets (POMCUS) and sealift. When the Gulf crisis took place in August 1990. . . the US led coalition was afforded the time needed to deploy by sea. . . The operational immobility of heavy forces was further revealed during Operation Joint Endeavor, the deployment of Army forces to Bosnia during the winter of 1995-1996. The deployment of a reinforced

brigade of only four armored and infantry battalions via rail and roads took nearly 2 months.¹⁵

The Strike Force initiative seeks to alleviate the disparity of the "barbell structure" (very heavy forces on one side and very light forces on the other with little medium force capability in between) by leveraging force tailoring to gain the advantages of a medium weight force.¹⁶ In the words of TRADOC's deputy chief of staff, MG Dan Zanini:

"There is a need for a 'medium-weight' force that is deployable within about 96 hours, that has decisive deterrence capabilities when it arrives in theater."¹⁷ A medium weight force, achieved through force tailoring is a structural solution to the problem that can be achieved in the near term without the requirement to develop new weapons or entirely new organizations. A medium weight force would have improved deployability and sustainability relative to a heavy force, and improved lethality, mobility and survivability relative to a light force. In essence, a medium weight force would reflect the best of both the light and heavy worlds by creating a force tailored to the specific requirements of the national security environment and available strategic lift assets. Because the Army does not expect to field new weapons or create entirely new medium weight forces from the ground up; at least in the immediate future, force tailoring can serve as the catalyst to achieve the characteristics of a medium weight force within the confines of the existing force structure.

Again, force tailoring is defined as "the capability to determine the right mix and sequencing of units with sufficient combat power to accomplish the mission and sustain the force, based on METT-T analysis, and other criteria such as available lift, pre-positioned assets and host nation support."¹⁸ Force tailoring consists of creating a force

from the existing Army force structure to provide the functions required for a specific mission environment. Forces and headquarters that are deemed unnecessary are not invited into the theater. In this manner, force tailoring reduces the "footprint" of US forces in the theater. Footprint reduction will yield significant advantages for the Strike Force Headquarters.¹⁹

Footprint reduction enabled by force tailoring will improve the Strike Force's strategic deployability, lethality, theater mobility, sustainability and survivability. Force tailoring seeks to streamline a deploying force by deploying only those *functions* that are required to fulfill a specific mission. In this manner, unnecessary headquarters, combat, combat support and combat service support elements do not consume the very limited strategic lift assets. For instance, analysis of a particular contingency mission may indicate that the situation is best suited for a light infantry brigade but with a premium requirement for heavy engineer capabilities to assist in mine clearing operations. The tailored headquarters would have the latitude to select the appropriate functions from the Total Army force structure rather than be bound to selecting a particular unit for deployment. Only the necessary capabilities and their associated CSS would deploy into theater. Further, information technologies will replace some units that in the past may have consumed strategic lift space. For instance, the concept of reach-back technologies will connect with and use the knowledge base of reach-back providers in CONUS or some other enclave rather than physically deploying that capability into theater.²⁰

Telemedicine, terrain analysis products, national level intelligence assets and the like are prime candidates for reach-back. Because a tailoring headquarters can select capabilities from across the Total Army force structure it is not limited by selecting a specific unit for

deployment into theater. Force tailoring also contributes to greater lethality, particularly for early entry forces. TRADOC Pam 525-5 predicts that "early entry operations will be conducted by forces that are not necessarily light or heavy, but tailored to METT-T in order to create the best possible capabilities-based force to meet the needs of any given contingency."²¹ Force tailoring allows a commander to optimize strategic lift to deliver that appropriate mix of forces that is lethal enough to confront a determined foe yet not so strategically cumbersome that it is virtually non-deployable in the time required to take advantage of a developing opportunity. In this respect force tailoring enables greater lethality. The reduced footprint afforded by a tailored force also reduces the logistics liability of the force. Because only "necessary forces" are on the ground, overhead of people and equipment is reduced. Further, tailorability may permit the commander to optimize in-theater airfields and port facilities that may be capable of supporting a smaller tailored force versus a larger homogenous force. A reduced footprint also presents a smaller target for terrorist attacks and is less susceptible to the growing threat of enemy theater ballistic missiles and NBC threats.²² A tailored force, then, is likely to be more survivable. In each of these cases there is value gained by tailoring a force based upon function rather than unit type. However, in order to leverage force tailoring the Total Army force structure must become more modular in nature than exists under the current force structure.

The current hierarchical Army structure may not lend itself to successful force tailoring. TRADOC Pamphlet 525-68, Concept for Modularity, indicates that:

Task organizing and force tailoring often require the deployment of 'slices' from organizations. This frequently renders the residual portion of the 'sliced' unit incapable of continuing its full spectrum of missions due to loss of

key personnel and equipment. . . . responding to the ever growing number of challenges (facing the Army) requires more efficient packaging of force capability which can be provided through modularity.²³

For instance, the Army simply cannot afford to task organize an MLRS platoon to the Strike Force Headquarters if doing so disables the remainder of the battery and prevents its deployment elsewhere. Nor can the Army afford to deploy the entire MLRS battery into a theater if the mission only requires the capability of the platoon. This is inefficient use of strategic lift assets. Modular force design offers a potential solution to this dilemma. TRADOC Pam 525-68 defines modularity as. . . "a force design methodology that establishes a means to provide interchangeable, expandable and tailorable force elements."²⁴ Further, "modular organizations contain modules or elements that replicate, increment, or vary discrete functional capabilities that allow the unit to operate as an entity in one location or as self sustaining parts of that entity at a different location."²⁵ Modular organizations promise to be more responsive, economical, effective, and flexible than traditional hierarchical organizations.²⁶ These tenets of modularity are essential for successful force tailoring. Modular organizations are more responsive in that they allow for ease of identification of necessary functions on short notice. Modularity will enable the Army to achieve economy of scale by deploying only those functions and capabilities needed for the mission. Only needed functions and capabilities are provided from a parent organization at the appropriate time and place. Modularity proves effective because it facilitates adaptive force packaging which is METT-T driven. It is more flexible because it is expandable, contractible, and able to interconnect diversified functions and capabilities operating in the same area.²⁷ These characteristics of a modular organization make it particularly appealing to a Strike Force commander

seeking to leverage force tailoring to provide a more deployable, lethal, mobile, sustainable and survivable force.

Force tailoring enabled by modular force design is central to the Strike Force concept. "The Strike Force concept allows us to take the vast arsenal of capabilities with America's Army and to tailor them to meet the more diverse threats in today's world. The concept envisions a world class command and control headquarters that will initially have very little permanently embedded capabilities, but will be able to command and control the vast array of capabilities inherent across the Total Army. It will be able to operate as part of a joint or combined operation."²⁸ The transition to Strike Force represents a change to the existing command and control structure and not the creation of a new specialized unit. The Strike Force Headquarters is the mechanism which will transform existing force capabilities into a more adaptable force structure to meet the complex demands of the National Security Strategy. For the immediate future, Army leaders envision that this mechanism will take the form of an *Interim* Strike Force Headquarters.

The *Interim Strike Force Headquarters* concept evolved in the Fall of 1998 with the decision not to fully fund the Strike Force in the near term. In October 1998, General Dennis Reimer, Army Chief of Staff, "vetoed TRADOC's recommendation to build a \$1.1 billion Strike Force. . . . Rather than spend more than \$1 billion (that would jeopardize major weapon's procurement initiatives) establishing a 3,000 to 5,000 soldier early-entry unit, Reimer opted to stand up an *Interim* Strike Force Headquarters, using the 2d ACR's Headquarters as a building block, under which the Army could 'plug' in existing battalions from elsewhere in the Army."²⁹ In a 7 January 1999 interview with

the Army Times, General Reimer elaborated: ". . .What we need is a world-class command and control capability upon which we can hang conventional capabilities. . ."

He went on to say: "What I'm looking for is a command and control Headquarters that could be plugged into a joint task force to control some of these capabilities as an initial deployer."³⁰ By the year 2001 the Army will establish the Interim Strike Force Headquarters to serve this purpose.

The Interim Strike Force Headquarters Concept seeks to provide a "flexible and adaptable Headquarters, capable of employing a broad range of forces to achieve different mission requirements ranging from early entry, decisive, and stability and support operations." The Interim Strike Force Headquarters will likely control between 2,000 and 3,000 combat, combat support, and combat service support soldiers. The Interim Strike Force Headquarters will expand or contract in accordance with mission requirements. "Plug-In" units will include analog, digital, and hybrid teams of subject matter experts and will support joint and combined operations as required. The Interim Strike Force Headquarters will husband an organization tailored toward the application of the right force at the right time and place.

The expandable and contractible Interim Strike Force Headquarters will consist of a command group comprised of two command nodes, and a control group comprised of multi-functional staff support nodes and multi-functional LNO nodes. The Command group operates from Command Node 1 for the commander and Command Node 2 for the Deputy commander. Each node provides a stand-alone capability to permit tailoring of the headquarters for split-based operations and facilitate command presence in multiple battlespace locations. The Control Group is composed of an Intelligence node, an

Effects Coordination Node, a Force Protection Node, a Life Support Node, an Information Support Node and a Combat Service Support Node. It is envisioned that the chief of staff or deputy commander will lead the control group which will rely upon reach-back capabilities to reduce its in-theater footprint. The control group will rely upon "plugs" to accomplish unique tasks and will tailor itself to the mission environment. Command and control technologies could enable it to operate from a sanctuary outside of the theater of operations thereby improving its survivability. The control group also husbands the five digital LNO nodes.

Each of the five Digital LNO Nodes will consist of an LNO Cell and a Communications Cell and will be capable of independent, self-sustained operations. The primary functions envisioned for the Digital LNO Nodes are to "provide strap on digitization to higher, adjacent and lower headquarters as required and play a key role in pre-deployment training of operational unit staffs to facilitate rapid team building." An O-4 (Major) will control the operations of the nodes and lead a node himself. O-3's (Captains) will lead each of the remaining four LNO nodes. Each LNO Cell will contain two vehicles for the CSS LNO and AFTDS LNO respectively. The communications cell accompanying the LNO cell will consist of a STAR-T and SEN managed by an E6 Net manager and an E5 switch operator. These LNO Nodes will serve as the primary integrative control mechanisms to enable force tailoring.

Integration of the varying capabilities harvested from the Total Army force structure and tailored to a specific mission on short notice could prove the Strike Force Achilles' heel. The command and control implications are obvious. World Class command and control capabilities are required to enable force tailoring through

modularity. The Interim Strike Force Digital LNO Nodes will serve as the integrative control mechanisms that will interface between the modules assigned to the Interim Strike Force Headquarters during force tailoring and become a critical link to enabling force tailoring. According to Lieutenant General Randall Rigby, Deputy Commander, US Training and Doctrine Command: "The hardest thing we'll have to do as we field this force is what we call command and control on the move."³¹ Force tailoring promises a more deployable, lethal, mobile, sustainable and survivable force. However, as General Rigby points out, force tailoring can pose substantial command and control challenges that, unless addressed, may threaten the viability of the force tailoring concept altogether.

Chapter 3

Information Pathology: A Force tailoring challenge to command and control

A one man Army requires no command.³²

Martin van Creveld, *Command in War*

The Interim Strike Force Headquarters is susceptible to information pathology. Information pathology is the inability of organizations to obtain a clear, timely picture of their surroundings and their own functioning, owing to structural defects.³³ Information pathology hinders an organizations ability to control itself and of leaders to make informed decisions. "Complexity and specialization, organizational instability and centralization . . . cause an inordinate increase in the amount of information needed to make any given kind of decision at any given level."³⁴ The command and control complexities associated with force tailoring combined with the increased complexity of the environment in which the Interim Strike Force is expected to operate are the two primary contributing factors to Interim Strike Force susceptibility to information pathology.

Complexity creates the conditions for information pathology because it contributes to greater uncertainty. In Command in War, Martin van Creveld, suggests that the necessity for command and control in war becomes more difficult and more necessary as complexity increases.

The need for command arises from, and varies with, the size, complexity, and differentiation of an army. A one-man army requires no command. . . Once a force of any size is subdivided into several subunits, however, the problem of assigning a specific mission to each, and of ensuring proper coordination among all, becomes much more difficult. These difficulties grow with the number of

units, the power and range of their weapons, the speed at which they move, and the size of the spaces over which they operate.³⁵

As the complexity of the situation increases it becomes necessary to adjust the command and control organizational structure to deal with the increased requirements for information. Failure to do so will result in an information pathology.

Uncertainty being the central fact that all command systems have to cope with, the role of uncertainty in determining the structure of command should be-and in most cases is-decisive. . . It is vital, in other words, for the structure and modus operandi of any command system to be adapted to the measure of uncertainty involved in the performance of the task at hand.³⁶

Failure to cope with the increased uncertainty will result in an information pathology and an inability of the Strike Force to perform its missions. An understanding of the source of this uncertainty must begin first with an understanding of the complex missions proposed for the Interim Strike Force Headquarters.

The complex environment in which the Strike Force will likely operate contributes to its susceptibility to information pathology. The Interim Strike Force headquarters is designed to command and control a force that is capable of performing across the full spectrum of military operations. According to a TRADOC Strike Force Information paper: "Optimized for early entry, peace operations, humanitarian assistance as well as combat, Strike Forces contribute to the whole spectrum of operational capability."³⁷ While the size of the Strike Force is likely to remain a manageable 3,000 to 5,000 troops, the broad range of missions has daunting implications for command and control of the Strike Force. It is one thing to consider the Army a full spectrum force, it is an altogether different challenge to place that burden upon a single controlling headquarters. The Interim Strike Force Headquarters must leverage force tailoring and

exercise command and control over potentially any unit in the Total Force inventory. This will include active and reserve component units and include the full gamut of capabilities from combat, combat support and combat service support. The Interim Strike Force headquarters must be capable of command and control in a joint environment and in combined operations with a host of allies worldwide. Stability and support operations place other unique challenges on the command and control capabilities of the headquarters. In these operations, coordination with other governmental organizations, non-governmental organizations and foreign governments is at a premium. Further, the headquarters must master and maintain "reachback" connectivity with a myriad of organizations operating from CONUS or from some other safe enclave. Indeed a full spectrum capability is one of many appealing characteristics of the Strike Force afforded by force tailoring and modularity. However, there are clear command and control implications. Does this broad range of missions present such a complex environment as to prohibit the Interim Strike Force headquarters from mastering any part of the spectrum? According to the Martin van Creveld the answer to this question will largely depend upon the organizational structure of the Interim Strike Force Headquarters.³⁸

In addition to the complex array of missions envisioned, the organizational structure proposed for the Interim Strike Force Headquarters also makes the organization susceptible to information pathology. In most cases, in both the business and military world, authority is structured within the organization in order to better manage how information flows through the organization.³⁹ This allows the organization to process information better and to make better decisions. Improving information management,

however, was not the driving force for the organizational restructuring of the Interim Strike Force Headquarters concept. The Interim Strike Force Headquarters concept was predicated upon enabling force tailoring to address the challenges of the external environment and the realities of force projection. It was not designed to optimize the interaction of the component parts of the organization but instead to enable force projection and the flexibility required of a full spectrum force. Force tailoring and modularity took precedence over constructing an organization optimized to reduce the uncertainty of the battlefield.

Paradoxically, the organizational structure of the headquarters concept could create an information pathology that inhibits adaptability rather than enables the adaptability that the concept was seeking from the outset. Because force tailoring and modularity create a flatter organization than the traditional hierarchical military organization, there is a premium on decentralization of decision making to the modules that are "plugged in" to the Interim Strike Force Headquarters. This is at once a strength and a vulnerability. This is a strength in terms of improving adaptability of the force as a whole because subordinate units would be expected and be given the latitude to make decisions "closer" to the sources of information. However, it is a vulnerability in that the Interim Strike Force Headquarter's span of control and difficulty in integrating the actions of its many and diverse subordinate modules may contribute to information pathology.

The increased span of control and decentralization innate to force tailoring may lead the Interim Strike Force Headquarters to seek increased volumes of information and increased control in order to reduce the uncertainty of the complex environment in which it is expected to operate. This is of particular concern given the availability of

information with the emergence of digital command and control technologies. By definition this could lead to information pathology. In his book The Logic of Failure, Dietrich Dorner provides some insight into the dilemma that the commander of the Interim Strike Force may face. He suggests:

The two modes of behavior are opposite sides of the same coin. We combat our uncertainty either by acting hastily on the basis of minimal information or by gathering excessive information, which inhibits action and may even increase our uncertainty. Which of these patterns we follow depends on time pressure or the lack of it. The carousel of positive feedback, of information gathering and increasing uncertainty, does not spin eternally. If we are unable to satisfy ourselves at some point that we do in fact have enough information, we finally throw in the towel.⁴⁰

It is important to realize that the Interim Strike Force Commander must deal with the complex array of missions, a potentially vast span of control, and an organization that lacks the cohesion born of habitual relationships and long term training relationships. The Interim Strike Force commander may succumb to the temptation to demand greater clarity and more information to deal with the resulting uncertainty. In doing so he risks infecting the organization with an information pathology. Subordinate "plug in" units could spend an inordinate amount of time filling the headquarter's information void and less time focused on accomplishing the task and purpose which it is assigned. The Interim Strike Force Headquarters needs a braking mechanism to balance the uncertainty created by the Strike Force environment and structural design and the desire to counter that uncertainty by interrupting the decentralization and flexibility that modularity and force tailoring can provide.

A control mechanism is required to satisfy the headquarter's requirement to integrate the actions of its diverse component parts while at the same time affording

those component parts the decentralized freedom that is necessary to keep the organization adaptive. Eliot A. Cohen and John Gooch, in Military Misfortunes, suggest that an organization's adaptability is directly proportional to the organization's "conception of command". By this they mean that "some systems of command make adaptation to unexpected or unforeseen circumstances relatively easy, while others make it virtually impossible."⁴¹ Martin van Creveld suggests that command systems must find a way to either reduce the information requirements or increase the ability to process more information.⁴² Failure to do so will result in an information pathology that will cripple the organization's ability to adapt to "unforeseen circumstances". System control mechanisms will play a vital role in allowing the system to maintain its adaptive and self-organizing qualities in this complex environment. The Interim Strike Force Headquarters must overcome the dual impact of operating in an increasingly complex environment on the one hand and preserving the benefits of a flat, decentralized organizational structure on the other. Integrative control mechanisms will play a central role in enabling this arrangement of missions and organizational structure.

Chapter 4

Digital LNO's as Directed telescopes for the Strike Force Commander: The Role of Integrative Control Mechanisms in Maintaining System Adaptability

TRADOC Pam 525-5, Modularity, indicates that core processes, and integrative control mechanisms are essential to enable force tailoring of an organization.⁴³ The Interim Strike Force Digital LNO Nodes must serve as integrative control mechanisms for the Interim Strike Force commander. As outlined in the previous chapter, the organizational structure and complex environment in which the Strike Force is designed to operate makes it susceptible to information pathology. As integrative control mechanisms the Digital LNO Nodes serve as a possible immunization against this condition. This chapter describes the nature of complex systems and the role of control mechanisms in maintaining the adaptive, self-regulating qualities of the system. Finally, this chapter suggests that the Digital LNO nodes must serve as directed telescopes for the commander in order to preserve the decentralized structure of the Strike Force while satisfying the headquarter's requirements for information. In this respect, the Digital LNO teams serve as guardians of system's aim and ensure that the Strike Force remains an adaptive complex system capable of force tailoring. It is necessary to understand the nature of complex adaptive systems in order to appreciate the vital role of integrative control mechanisms.

Amid the changes wrought by the Industrial Revolution came a time of growing complexity for the military and for the world in general. From this complexity, the General System's Theory arose to describe the characteristics of complex adaptive systems. "The systems concept was formulated by the Hungarian scientist Ludwig von Bertalanffy, whose main contribution was the basic rationale for the interdisciplinary approach to systems. His concept grew out of a growing skepticism regarding the abilities of the prevailing analytical-mechanistic approaches to respond adequately to challenges posed by the complexities of modern society and technology."⁴⁴ Bertalanffy states:

It is a change in basic categories of thought of which the complexities of modern technology are only one - and possibly not the most important manifestation. In one way or another we are forced to deal with complexities, with 'wholes' or systems, in all fields of knowledge. This implies a basic reorientation in scientific thinking.⁴⁵

Expanding on Bertalanffy's "Vision of the Whole", M. Mitchell Waldrop in Complexity outlines the characteristics of a complex system. First, ". . . a system is complex in the sense that a *great many independent agents are interacting* with each other in a great many ways."⁴⁶ Second, ". . . the very richness of these interactions allows a system as a whole to undergo *spontaneous self-organization* whereby. . . groups of agents seeking mutual accommodation and self-consistency somehow manage to transcend themselves, acquiring collective properties such as life, thought, and purpose that they might never have possessed individually."⁴⁷ Furthermore, ". . . these complex, self-organizing systems are *adaptive*, in that they don't just passively respond to events the way a rock might roll around in an earthquake. They actively try to turn whatever happens to their advantage."⁴⁸ Fourth, ". . . every one of these complex, self-organizing, adaptive systems

possesses a kind of *dynamism* that makes them qualitatively different from static objects (such as a snowflake) which are merely complicated. . . . These systems have found a **mechanism** to bring order and chaos into a sort of balance - often called the edge of chaos - which is where the components of a system never quite lock into place (become rigid) and yet never quite dissolve into turbulence either."⁴⁹ In citing Waldrop, Schneider asserts that it is ". . . essentially meaningless to talk about a complex adaptive system being in equilibrium: the system can never get there. It is always in transition."⁵⁰ How can systems possess and maintain this dynamism, self-organization and adaptability? Interestingly the answer to this question illuminates both the strength and the weakness of complex open systems.

All complex open military systems must have a control mechanism to maintain the dynamism which is necessary for it to remain adaptive and self-organizing. James R. Beniger in his book, The Control Revolution, explains this phenomenon through the analysis of living systems. First, he defines control as "the purposive influence toward a pre-determined goal."⁵¹ Next, he suggests that control is "achieved through programming: it depends upon physically encoded information which must include both goals toward which a process is to be influenced and the procedures for processing additional information toward that end."⁵² Finally, he indicates that systems require inputs of information to control by making decisions.⁵³ Dr. Schneider reinforces this analysis by concluding that "there are a number of aspects of complexity but all turn on the way a complex adaptive dynamic system uses information."⁵⁴ He asserts that a modern complex military system uses information five ways. "First, it uses information to describe itself and its enemy. Second, a complex military system uses information to

organize itself. Third, the complexity of the battlefield and the rise of the operational art made armies algorithmically complex. Complex systems require an ability to process more information to deal with this complexity. Fourth, the logistics of information - its acquisition, processing and distribution- became complex. Finally, military technology makes modern forces complex, thus requiring more and better information."⁵⁵ In short, because systems are complex they use information dynamically to remain adaptive and self-organizing.

The French sociologist Emile Durkheim concluded that a system could fail as individuals that composed the system became isolated. This concept of *anomie* results when communication between the individuals loses clarity and they begin to lose sight of the organization's intended direction and purpose.⁵⁶ Clearly, information necessary to transmit direction and purpose is at the heart of the control mechanism of a complex military system.

While the control mechanism lends powerful attributes to the system it also burdens the system. The system must maintain its information diet in order to nurture the system and keep it focused on its intended purpose or aim. Without control a complex system accelerates towards what Beniger refers to as "Heat Death" or "...an unorganized, randomly distributed, inconvertible state of its particles (components). . . ." Beniger asserts that based upon the 2nd law of thermodynamics, a system's energy cannot be converted from one form to another without decreasing its organization and hence its ability to do further work. Herein lies the vulnerability of complex open military systems. Without an effective control mechanism, open military systems face an inevitable death because they lose the dynamism to recognize changes in their

environment and adapt to them. "Living systems are open systems that continuously lose energy to their environments."⁵⁷ As a result, systems tend toward greater entropy or disorder and death. "Thermodynamics thus explains what it is that all living systems must control, and why such control is essential to life itself. All open systems, if they are to postpone for a time their inevitable heat death, must control the extraction and processing of matter (information), its internal distribution and storage, continuous conversion into energy (aims), and elimination as by-product wastes."⁵⁸ This analogy is closely related to the idea of information pathology. Without a mechanism to regulate the flow of information a system becomes ill, unable to function at an optimal level, and in extreme cases experiences system breakdown and dies.

Shimon Naveh in his book, In Pursuit of Military Excellence, not only recognizes the central role of a control mechanism but suggests that the system's aim is the control mechanism that essentially defines a complex system and gives it the dynamism required to remain self organizing and adaptive in a turbulent environment. He states: "Clearly, the essence of a system centers on the existence of the interaction between its component parts more than on anything else."⁵⁹ He continues by asserting that the interaction of the component parts of a complex system is dominated by the system's aim.

The initial assertion of the aim by the system's brain or directing authority predetermines the comprehensive whole i.e. the all-embracing accomplishment of its future destined action. It also provides the focus of the system's performance since it creates the framework for the interrelations between its various elements. . . In other words, the definition of aim is the cognitive force that generates the system and determines the directions and patterns of its action.⁶⁰

Accordingly, Naveh asserts that "the aim of a system constitutes its brain, its heart, and its self-regulating agency."⁶¹ The aim constitutes the system brain (nervous system) by providing a "cognitive compass" which keeps the system as a whole moving toward its predetermined goal. The aim resembles the functioning of the heart (circulatory system) by providing the component parts (individual soldiers or units) of the military system with concrete objectives and detailed missions that lead to the overall predetermined goal. The self-regulating nature of complex systems also rests with the aim because by focusing a system on final objectives aim provides the system a mechanism to overcome external disturbances.⁶² Beniger, Schneider, Durkheim, and Naveh all conclude that the information control mechanism, by transmitting aim and purpose, is the element that provides a complex open system with the dynamic interaction that it requires to survive in a turbulent and chaotic environment. This places a premium on the system's ability to share and process information to maintain focus on the predetermined aim.

The Digital LNO nodes must serve as an integrative control mechanism that permits the Strike Force to maintain the adaptive qualities that it needs in a complex environment. While this is an essential function for any complex system, it is particularly critical for the Interim Strike Force Headquarters. Because the Interim Strike Force Headquarters design was generated to take advantage of force tailoring, the digital LNO nodes must fulfill the role of integrative control mechanism while maintaining the characteristics of a decentralized force tailored organization. Along with the aforementioned benefits, rapid force tailoring brings with it some inherent weaknesses that the digital LNO nodes must counter if the system is to remain adaptive and self regulating. In particular, rapid force tailoring denies the organization the time required to

train and build unit cohesion and standardization. As a result, the headquarters may tend to compensate for this void in cohesion by attempting to centralize command and control and by creating a mechanistic organization. In doing so it would create an information pathology and degrade system adaptability. Digital LNO Nodes can counteract this tendency toward centralization. As directed telescopes for the Interim Strike Force Commander the LNO Nodes can serve as integrative control mechanisms, fulfill the headquarters information appetite, ensure modules continue on course toward a common aim, and enable the organization to retain the advantages of decentralization. The role of directed telescopes in preserving system aim and the benefits of decentralized execution is exemplified best by contrasting the British system of command prior to the Somme in 1914 and the German system of command prior to the Ludendorf Offensives of 1918.

Chapter 5

The German Model: Directed Telescopes Enable Decentralization

It is a truth beyond argument that full and accurate information becomes most vital at the point of impact, for unless it is correctly applied there, the wisest plans of the ablest general will likely fail.⁶³

S.L.A. Marshall, *Men Against Fire*

S.L.A. Marshall highlights an important paradox. While it is clear that "full and accurate information becomes most vital at the point of impact" he argues that "the organization of tactical information during combat runs directly counter to this principle." Traditionally staff mechanisms and commanders at higher levels often lose sight of the original purpose of collecting the information in the first place; to assist the decision of the commander at the point of impact.⁶⁴ This paradox is at the heart of information pathology. The German and British experiences in World War I provide contrasting organizational approaches to solving the problem of uncertainty and decision making on the battlefield. The German Army decentralized decision making and information flow in its reorganization prior to the Ludendorf offensives of 1918 with decisive results at the tactical level. By contrast, the British centralized system of command stripped subordinates of decision authority and imposed an information pathology on the army that prevented it from adapting to the turbulent environment of the Somme in 1916. The reaction of each of these organizations to the increased complexity and uncertainty of the battlefield environment is relevant to an understanding and evaluation of the Interim Strike Force Headquarters organizational structure and potential for adaptability.

The Interim Strike Force faces the watershed decision of whether to organize its control structure to facilitate decentralization with directed telescopes to aid decision making at higher echelons or to build a structure that favors centralization afforded by digital communications technology. Tailorability and the complex external environment outlined in detail in Chapter 3 suggest that the Interim Strike Force must pursue a decentralized organization similar to the German organizational adaptation prior to the 1918 offenses. Like the German model, this decentralized structure must have control mechanisms in place that ensure the dynamic interaction of the many diverse component parts of the system without denying the benefits of decentralized decision making. The German model offers that these control mechanisms must perform as directed telescopes for the higher commander to fulfill the multifaceted role of informing the higher headquarters and ensuring unity of effort toward a predetermined goal, while at the same time preserving the lower headquarters freedom of action. The British centralized model serves as a beacon for the pitfalls of centralized decision making enabled by "state of the art" communications technology.

Alfred Graf Schlieffen clearly recognized the trend toward decentralization as early as the 1890's. Following one of his many staff rides with the students of the German General Staff College in 1894 he commented:

In commanding armies today one can see fundamental differences when compared with earlier periods. A commander can no longer direct the battle with help from a few adjutants and ordinance officers. The army is far too large. . . things do not normally go smoothly and methodically, they happen only with difficulty. Sudden changes arise from new circumstances. For these situations orders from the high command are impossible. Lower-ranking officers therefore must of necessity reach independent decisions.⁶⁵

Prior to the Ludendorff offensives of 1918 the German General Staff recognized that the stalemate on the western front required adjustments to the organizational structure and training. A solution was founded on decentralized execution by the subordinate elements in contact with the enemy and was enabled by a system of directed telescopes born by the educational system of Moltke and Schlieffen in the late 19th century.

The contrasting British and German views regarding the impact of uncertainty on the battlefield was the central determining factor of how each army organized for and used information on the battlefield.

With the experience of Koniggratz (1866) and any number of battles in the Franco-Prussian War to guide them, the Germans came to regard confusion as the normal state of the battlefield, and the remedy was sought not in any strict regimentation on the British model but in further decentralization and the lowering of the decision thresholds.⁶⁶

The British, however, wished to overcome uncertainty on the battlefield with mechanistic rules imposed on units linked by telegraph. They felt that centralized planning and coordination could impose order on the battlefield.

What the British High Command feared most. . . was the kind of battlefield confusion that would make effective command from above impossible. . . Confusion, in a word, was to be banished from the battlefield; that this could only be done at the cost of constricting tactics to the point that the battle would be lost before it ever started nobody seems to have considered.⁶⁷

The British experience at the Battle of the Somme in the summer of 1916 clearly demonstrates the disastrous results of attempting to impose order on an environment that is innately chaotic.

The British viewed the battlefield as a geometric and quantifiable environment. The telegraph was seen as the primary instrument to bring the kind of resolution that commanders sought to ensure that this environment was kept within the parameters of

the envisioned plan. This mindset placed artificial restrictions on planning for the Somme offensive. "General Headquarters sometimes fell into the trap of constricting operations in such a way as to make them controllable by wire."⁶⁸ This mindset imposed a strict rigidity upon operations. "Planning and obedience are regarded as the key to victory; any opportunism, or any mutual cooperation not explicitly provided for is discouraged if not prohibited, it being assumed that the commander in chief alone is in possession of all the facts and therefore able to introduce whatever changes in the plan may be required."⁶⁹ Tied to the end of a telegraph, Martin van Creveld suggests that the entire army was inflicted with a telephonitis that separated leaders from soldiers. Leaders felt compelled to remain available to higher headquarters and depended on soldiers to robotically execute a predetermined plan. Plans disintegrated shortly after the attack began and no mechanism was in place to compensate for inadequate and static telegraph wires that were susceptible to destruction by enemy fires. "The British, possibly acting on a telephone-dependent habit, did not even try (to use a directed telescope to gain clearer information about the situation)".⁷⁰ J.F.C. Fuller describes the impact of centralization:

As the general became more and more bound to his office, and, consequently, divorced from his men, he relied for contact not upon the personal factor, but upon the mechanical telegraph and telephone. They could establish contact, but they could accomplish this only by dragging subordinate commanders out of the firing line, or more often persuading them not to go into it, so that they might be at the beck and call of their superiors. In the World War nothing was more dreadful to witness than a chain of men starting with a battalion commander and ending with an army commander, sitting in telephone boxes talking, talking, talking in place of leading, leading, leading.⁷¹

This centralized approach imposed an information pathology on the British army.

Unable to adapt from the original plan, the British rigidity inevitably led to 60,000 British casualties on the first day and over 400,000 in a period of less than six months.⁷²

The German decentralized system of command achieved far better tactical results than the British centralized system, as evidenced by the Ludendorf offenses of 1918. The German education system initiated by Moltke and Schlieffen in the 1870's to 1890's continued to have an impact on the German Army culture into World War I.

Their peculiar general staff system also led senior commanders to give broad orders - Weisungsführung, or "leadership by directive" as it was called. But balancing this was the practice of delegating to general staff members or other experts a kind of plenipotentiary power - Vollmacht - which short circuited the chain of command when that proved necessary. Repeatedly during the war general staff officers of the rank of lieutenant colonel or colonel took control of situations that seemed on the brink of disaster.⁷³

This decentralized approach was made possible by a culture that encouraged independent action to seize opportunities as they occurred at the tactical level. By empowering subordinate leaders to make decisions, leaders felt less compelled to consume their time answering the inquiries of higher headquarters. Coordination among subordinate units was encouraged. But the most important ingredient that enabled this decentralization to flourish was the existence of a successful program of directed telescopes. The directed telescope concept was institutionalized into the German system and accepted by subordinates and seniors alike for its dual purpose. German directed telescopes to a subordinate headquarters were empowered with the higher commander's intent and the power to interject in the affairs of the subordinate if it appeared that the subordinate situation was not progressing in accordance with the higher purpose and aim. In return,

the directed telescope relieved the subordinate headquarters of the requirement to remain in constant contact with the higher headquarters.

The twin elements of the German command system - the greater independence granted to subordinate leaders and the employment of general staff officers as the commander's eyes - thus complemented each other. The second was made necessary by the first; the first was in turn kept within bounds by the second.⁷⁴

Owing to the presence of a trusted agent at the scene of the action working together with a higher commander operating under broad mission orders; the higher headquarters felt less compelled than their British counterparts to interfere in a subordinate's decisions.

While the Ludendorf offensives failed to achieve strategic success for a variety of reasons, they clearly demonstrated the power of decentralized operations at the tactical level. Had Ludendorf displayed a level of opportunism at the strategic level that he demanded of his subordinates he well may have achieved a strategic success.⁷⁵ Martin van Creveld indicates that like their British counterparts in 1916, "the German General Headquarters was unable to form a clear picture of events; unlike the British, however, the Germans had expected this to happen and organized accordingly. The attack was thus able to make good progress in spite of the breakdown of control from above, and indeed made use of that very confusion to further accelerate its pace."⁷⁶ The German system of decentralized execution had proven successful in returning tactically decisive results to an environment that had known only stalemate for over 4 years.

The experiences of the British and Germans in World War I provide valuable lessons to consider for the development of the Interim Strike Force Concept. First, we must view the battlefield as an innately chaotic and complex environment. Rather than develop an organization that seeks to bring order to the chaos, the Interim Strike Force

must organize itself to execute the overall higher aim and purpose in a decentralized fashion. Because of the limited time available for the Strike Force Headquarters to integrate the many and varying capabilities it must rely on the expertise encapsulated within each of the modules that joins the Strike Force on short notice. Further, the Interim Strike Force Headquarters must resist the temptation to employ digital command and control technologies via the Digital LNO Nodes to increase centralized control of subordinates. To do so would be to encourage an information pathology similar that which plagued the British. The Strike Force Headquarters must have control mechanisms that define the overall aim of the system, integrate the organization vertically and horizontally while at the same time enabling the decentralization necessary for the organization to remain adaptive in a complex environment. The Strike Force's Digital LNO Nodes must serve as directed telescopes for the commander to enable subordinate modules to solve complex problems in a decentralized manner while at the same time serving as trusted agents of the commander by ensuring subordinates continue toward the overall aim and purpose of the organization. Decentralization and the use of directed telescopes were the byproducts of a German education system developed by Moltke and von Schlieffen over a period of several decades. This suggests that decentralization and the use of LNO's as trusted and effective directed telescopes will occur only through an education system that trains organizations and develops these trusted agents for the commander. The concepts of decentralization, directed telescopes and information pathologies provide a useful framework for analyzing the ability of LNO's to provide organizational adaptability.

Chapter 6

Analysis

By enabling the Strike Force Headquarters to operate in a decentralized manner and avoid the pitfalls of information pathology the Digital LNO Nodes provide the organizational adaptability required to enable Strike Force organizational tailoring. In Military Misfortunes, Eliot A. Cohen and John Gooch define adapting as "identifying and taking full advantage of the opportunities offered by enemy actions or by chance combinations of circumstances to win success or stave off failure."⁷⁷ They conclude that an adaptive organization has the following characteristics:

1. Ability to self-organize in the face of unforeseen circumstances.
2. Ability of components of the system to achieve unexpected levels of cooperation.
3. Ability of the organization to delegate unexpected tasks quickly and efficiently and quickly resolve competing demands.
4. Ability of the organization to unambiguously define the aim or goal.
5. Ability to prevent isolation of the component parts of the organization.
6. Conception of command (organizational structure and culture) determines whether the system is adaptable or not.⁷⁸

Interim Strike Force LNO nodes contribute to force adaptability and in doing so enable the Strike Force to harness the power of force tailoring.

Force tailoring can add powerful attributes to any future fighting force. As detailed in Chapter 2 force tailoring provides the right mix and sequencing of capabilities within the limits of strategic lift and METT-T. This will allow the Strike Force to feature the characteristics of a medium weight force and reduce the unit footprint in theater. As a consequence, this force is likely to be more lethal, more deployable, more sustainable, less vulnerable and more mobile once it arrives in theater.

However, harnessing the power of force tailoring may negatively impact Strike Force adaptability unless measures are taken to adjust organizational structure to enable force tailoring. In particular, force tailoring significantly increases the Interim Strike Force's span of control. Because the Strike Force Headquarters is expected to husband many diverse capabilities that are modularized it is likely to be a very flat organization. As a result it will have few intermediary command and control headquarters to serve as control mechanisms. This span of control dilemma is exacerbated by the fact that the tailored modules will not share a common training relationship with the headquarters or other modules, creating a vertical and horizontal command and control challenge. Finally, limited time is available to integrate the specialized modules of a tailored organization. Digital LNO's will serve the vital function as control mechanisms to alleviate many of these challenges.

As described in Chapter 4 every complex open system has control mechanisms that ensure the dynamism between the many and varied component parts of the system and give it its self-regulating and adaptive qualities. The Digital LNO Nodes serve this function for the Strike Force Headquarters. By facilitating the flow of vital information throughout the organization the LNO's must ensure that system aim and purpose is properly communicated to each module. As Naveh indicated, the dominant control mechanism in any system is system aim. Control mechanisms play the critical role as guardians of that aim. Further, as Durkheim indicated, system control mechanisms prevent components of the system from the condition of *anomie*, whereby components can become isolated from system aim and fail to adapt to a rapidly changing environment

as a result. Theory then suggests that the digital LNO's contribute to system adaptability by preserving system aim and preventing isolation of any of the component parts.

The historical perspective presented in Chapter 5 clearly demonstrated the role of LNO's as directed telescopes to enable a decentralized organizational structure. Decentralization is what Cohen and Gooch were referring to as "conception of command". They believe that a decentralized structure is paramount to preserving adaptability because decision authority is placed at the point where subordinates can seize "opportunities and stave off defeat" as these opportunities present themselves on the battlefield. Digital LNO's serving as directed telescopes ensure that the subordinate actions remain consistent with the overall commander's intent while relieving the tension between subordinate and higher headquarters that tends to hinder decentralized action. LNO's temper the benefits of decentralization with the higher headquarters requirements for control consistent with aim and purpose.

Finally, the Digital LNO nodes serve to immunize the organization from information pathology. Information pathology is in direct contradiction to adaptability because it threatens decentralization. As a consequence of information pathology, subordinate modules focus their efforts less on achieving the pre-determined aim of the organization and expend progressively more effort fulfilling the information requirements of the higher headquarters. If this occurs the organization loses its ability to self-organize in the face of unforeseen circumstances and its ability to achieve unexpected levels of cooperation between component parts of the organization to achieve the aim. Further, information pathology prevents the organization from delegating unexpected tasks quickly and efficiently and quickly resolving competing demands. The

Digital LNO's prevent information pathology by relieving subordinate headquarters of the requirement to remain "wed to the telephone" as with the British model. As trusted agents of the Strike Force commander the LNO's serve as information conduits for the commander and free subordinates to focus on making decisions at the point of impact. As Cohen and Gooch indicate in Military Misfortunes, military failures are failures of organizations and not necessarily failures of individuals.⁷⁹ Digital LNO's must serve the vital role of augmenting the Strike Force Headquarters staff by serving as directed telescopes to foster decentralization and ward off information pathology.

Chapter 7

Recommendations and Conclusions

If you fill these positions with proper officers. . .you might hope to have the finest army in the world.⁸⁰

General Robert E. Lee
21 March 1863

Interim Strike Force Digital LNO Nodes can provide the organizational adaptability required to enable force tailoring. The tension between the increased emphasis on force projection, the National Security Strategy requirements of global engagement, and budgetary and force development considerations have contributed to the development of the Interim Strike Force Headquarters concept. To address these competing demands, force tailoring accompanied by modularity of the force are the driving forces behind the structural reorganization of the Army. Through tailorability this new design seeks to create a force which is more rapidly deployable, more lethal, modular, more mobile, more sustainable and more survivable. However, force tailoring generates a set of challenges that must be addressed within the context of organizational structure. Force tailoring seeks to leverage a wide range of capabilities including joint, combined, host nation, light, heavy and the like. It will likely task organize on short notice without the benefit of a lengthy training and integration period and it will likely operate over an extended battlespace. Digital LNO's must serve as directed telescopes for the commander to maintain system adaptability, foster decentralization, and prevent information pathology in order for the organization to leverage the potential of force tailoring.

In order to serve effectively as directed telescopes Digital LNO's will require special selection and training. Because the primary role of the directed telescope is to serve as guardians of system aim, or in the case of the Strike Force to be guardians of commander's intent, Digital LNO's must have an appreciation for the linkage between strategic, operational and tactical levels of war. The LNO's are expected to operate as the commander's representative in environments that span the full spectrum of missions from humanitarian to general war. They will likely integrate or be integrated into multinational, joint and even political and non-governmental organizations. These roles clearly require special considerations for language training, joint qualification and experiences with the department of state. However, it is unreasonable to expect that the Digital LNO teams will be all things to all people. Digital LNO training and selection should focus on developing or selecting officers that exhibit the core competencies of good judgment, tact, initiative, acute perception, ability to express themselves and deliver impartial reports in clear and concise terms, and expertise incumbent with the level of command which they represent (Strike Force LNO's should be tactical experts with an appreciation of the operational and strategic levels of war).⁸¹ The historical precedent for directed telescopes indicates that the higher the rank the better in terms of credibility and trust when operating as the intermediary between a senior and subordinate commander. While the current structure suggests Majors and Captains, a Lieutenant Colonels/Major force structure would be much more effective. The Digital LNO nodes must also serve to integrate non-digital units into the Interim Strike Force Headquarters team. This is an opportunity for them to serve as a braking mechanism between the digital and non-digital units. Keeping in mind the disastrous experiences of British telephonitis in World War I,

the LNO nodes must remain sensitive to providing digital capabilities and guidance from the Interim Strike Force commander and allowing the technology to interfere with the subordinates decentralized execution. A non-digital subordinate must resist the temptation to wed himself to his only digital link to the Strike Force Headquarters and trust the LNO to convey an accurate assessment of the situation to higher headquarters. This highlights perhaps the greatest challenge to implementing a system of directed telescopes in the US Army; the requirement to adjust US Army culture to accept potential "spies" into the organization in order to preserve the freedom of decentralized execution. Strike Force commanders, subordinate commanders, and the LNO's themselves must clearly understand the role of the directed telescope and foster an environment that will allow them to operate. This means encouraging candor, empowering a degree of decision authority to the LNO's as long as it is consistent with commander's guidance, and adjusting the senior-subordinate commander relationship to accept the interjection of the LNO as a representative of the commander. This will require a level of trust which will develop only if the digital LNO's exhibit the aforementioned qualities of tact, judgment and proficiency. Digital LNO's can also serve a valuable integration role as distributed mobile training teams to assist the Strike Force commander in overcoming the limited pre-deployment training timelines associated with force tailoring. It is particularly critical to assign LNO nodes to multinational, joint or reserve component modules that are less familiar with SOP's, core competencies of the parent Strike Force organization. Further, Digital LNO nodes will serve as reachback technology facilitators to help reduce the Strike Force footprint in theater. As Cohen and Gooch indicated . . . "some systems of command make adaptation to unexpected or

unforeseen circumstances relatively easy, while others make it virtually impossible."⁸²

Without cultural acceptance of a properly selected and trained cadre of digital LNO's the force tailoring which makes the Interim Strike Force concept so attractive may make it "virtually impossible".

ENDNOTES

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- ¹ TRADOC Pamphlet 525-68, "Concept for Modularity", 10 January 1995, Foreword.
- ² These six force imperatives were taken from various briefings and articles given by Army senior leaders to SAMS students from JAN-MAR 1999.
- ³ LTG Randall Rigby, interview by Bryan Bender of Janes Defence Weekly, on <http://ebird.dtic.mil/Mar1999/s19990304rigby.htm>, 3 March 1999, 1.
- ⁴ This passage taken from various briefings and articles given by Army senior leaders to SAMS students from JAN-MAR 1999.
- ⁵ Dietrich Dorner, *The Logic of Failure*, trans. by Rita and Robert Kimber (New York: Metropolitan Books, 1989), 104.
- ⁶ Martin van Creveld, *Command in War* (Cambridge, MA: Harvard University Press, 1985), 316.
- ⁷ Gary B. Griffin, "The Directed Telescope: A Traditional Element of Effective Command" (Combat Studies Institute, U.S. Army Command and General Staff College: Fort Leavenworth, 1991), vii.
- ⁸ Scott W. Conrad, "Moving the Force: Desert Storm and Beyond" (Washington, D.C.: National Defense University, McNair Paper No. 32, December 1994), 3.
- ⁹ Thomas M. Cioppa, "Force Tailoring Tools" Technical Document TRAC-TD-0196 (Fort Leavenworth, KS: TRADOC Analysis Center Study Directorate, April 1996), 1.
- ¹⁰ These six force imperatives were taken from various briefings and articles given by Army senior leaders to SAMS students from JAN-MAR 1999.
- ¹¹ TRADOC PAM 525-5, "Force XXI Operations" (Fort Monroe, VA: Army TRADOC, 1 August 1994), p 4-5.
- ¹² Ibid. Glossary-7.
- ¹³ TRADOC Pam 525-68, "Concept for Modularity," 2.
- ¹⁴ Sean D. Naylor, "Reimer Defends Strike Force Headquarters," Army Times, 18 January 1999, p. 14.

¹⁵ John Gordon IV and Peter A. Wilson, "The Case for Army XXI 'Medium Weight' Aero-Motorized Divisions" (Carlisle Barracks, PA: Strategic Studies Institute, 27 May 1998), 5.

¹⁶ Ibid., 3-4.

¹⁷ Sean D. Naylor, "Strike Force Struck Down . . . for now," Army Times, 4 January 1999, p. 7.

¹⁸ TRADOC PAM 525-5, "Force XXI Operations," Glossary-7.

¹⁹ See John Gordon IV and Peter A. Wilson, "The Case for Army XXI 'Medium Weight' Aero-Motorized Divisions" (Carlisle Barracks, PA: Strategic Studies Institute, 27 May 1998), 1. for the value of footprint reduction.

²⁰ Strike Force Headquarters' O&O, Powerpoint slide 3.

²¹ TRADOC Pam 525-5, "Force XXI Operations," p. 3-12.

²² John Gordon IV and Peter A. Wilson, "The Case for Army XXI 'Medium Weight' Aero-Motorized Divisions," 2.

²³ TRADOC Pam 525-68, "Concept for Modularity," p 2.

²⁴ Ibid., 3.

²⁵ Ibid., 2.

²⁶ Ibid., 3.

²⁷ This paragraph paraphrased from TRADOC Pam 525-68 page 3 Tenets of Modularity.

²⁸ "Strike Force Information Paper" on the Strike Force Homepage accessed 29 March 1999 available from <http://www.tradoc.army.mil/pao/strike/info.htm>; Internet.

²⁹ Sean D. Naylor, "Strike Force Struck Down . . . for now," 7.

³⁰ Sean D. Naylor, "Reimer Defends Strike Force Headquarters," 14.

³¹ LTG Randall Rigby, interview by Bryan Bender of Janes Defence Weekly, on <http://ebird.dtic.mil/Mar1999/s19990304rigby.htm>, 3 March 1999, 1.

³² Martin van Creveld, *Command in War*, 6.

³³ Ibid., 316.

³⁴ Ibid., 237. Creveld uses Vietnam to illustrate the strain on information processing apparatus' imposed by complexity, specialization, organizational instability and centralization to induce information pathology. See also page 249.

³⁵ Martin van Creveld, *Command in War*, 6.

³⁶ Ibid., 268. van Creveld sites that the idea that uncertainty governs the structure of organizations is known as the contingency theory of organization. See J. Galbraith, *Designing Complex Organizations* (reading, Mass., 1973), especially chaps. 1 and 2.

³⁷ "Strike Force Information Paper" on the Strike Force Homepage accessed 29 March 1999 available from <http://www.tradoc.army.mil/pao/strike/info.htm>; Internet.

³⁸ Martin van Creveld, *Command in War*, 10.

³⁹ Francis Fukuyama and Abram N. Shulsky, "The Virtual Corporation and Army Organization" (Santa Monica, CA: Rand, 1997), ix-xi.

⁴⁰ Dietrich Dorner, *The Logic of Failure*, 104.

⁴¹ Eliot A. Cohen and John Gooch, *Military Misfortunes: The Anatomy of Failure in War* (New York: Vintage Books, 1990), 240.

⁴² Martin van Creveld, *Command in War*, 269.

⁴³ TRADOC Pam 525-5, "Force XXI Operations," 3-6.

⁴⁴ Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory* (London: Frank Cass Publishers, 1997), 3-5.

⁴⁵ Ludwig von Bertalanffy, *General System Theory* (New York, 1975), 3. quoted in Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory* (London: Frank Cass Publishers, 1997), 4.

⁴⁶ M. Mitchell Waldrop, *Complexity* (New York: Simon and Schuster, 1992), 11.

⁴⁷ Ibid.

⁴⁸ Ibid.

⁴⁹ These characteristics taken from M. Mitchell Waldrop, *Complexity* (New York: Simon and Schuster, 1992), 11-12.

⁵⁰James J. Schneider, "Black Lights: Chaos, Complexity and the Promise of Information Warfare," *Joint Forces Quarterly* 15 (Spring 1997) : 26.

⁵¹James R. Beniger, *The Control Revolution*. (Cambridge, MA: Harvard University Press, 1986), 7.

⁵²Ibid., 40.

⁵³Ibid., 48.

⁵⁴Schneider, "Cybershock," 6.

⁵⁵Schneider. "Black Lights," paraphrased from 27.

⁵⁶Beniger, *The Control Revolution*, paraphrased from 12.

⁵⁷Ibid., 37.

⁵⁸Ibid.

⁵⁹Shimon Naveh, *In Pursuit of Military Excellence*, 5.

⁶⁰Ludwig von Bertalanffy, *General System Theory* (New York, 1975), 68-70. quoted in Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory* (London: Frank Cass Publishers, 1997), 5-6.

⁶¹Naveh, 14.

⁶²Naveh, 14 and 15.

⁶³S.L.A. Marshall, *Men Against Fire* (Gloucester, MA: Peter Smith, 1978), 101.

⁶⁴Ibid., 101-103.

⁶⁵Arden Bucholz, *Moltke, Schlieffen and Prussian War Planning* (Providence, RI: Berg Publishers, 199), 144.

⁶⁶Martin van Creveld, *Command in War*, 169.

⁶⁷Ibid., 161.

⁶⁸Ibid., 158.

⁶⁹ Ibid., 166.

⁷⁰ This paragraph paraphrased from van Creveld's *Command in War*, 155-168.

⁷¹ Martin van Creveld, *Command in War*, 158 taken from Fuller, *Generalship: Its Diseases and their Cure*, 61.

⁷² Martin van Creveld, *Command in War*, 164.

⁷³ Cohen and Gooch, *Military Misfortunes*, 241.

⁷⁴ Martin van Creveld, *Command in War*, 172.

⁷⁵ Ibid., 181.

⁷⁶ Ibid., 180.

⁷⁷ Cohen and Gooch, *Military Misfortunes*, 160.

⁷⁸ Ibid., pp.160-163, 240.

⁷⁹ Ibid., 3.

⁸⁰ Gary B. Griffin, "The Directed Telescope: A Traditional Element of Effective Command," 1.

⁸¹ Ibid., 19-20.

⁸² Cohen and Gooch, *Military Misfortunes*, 240.

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